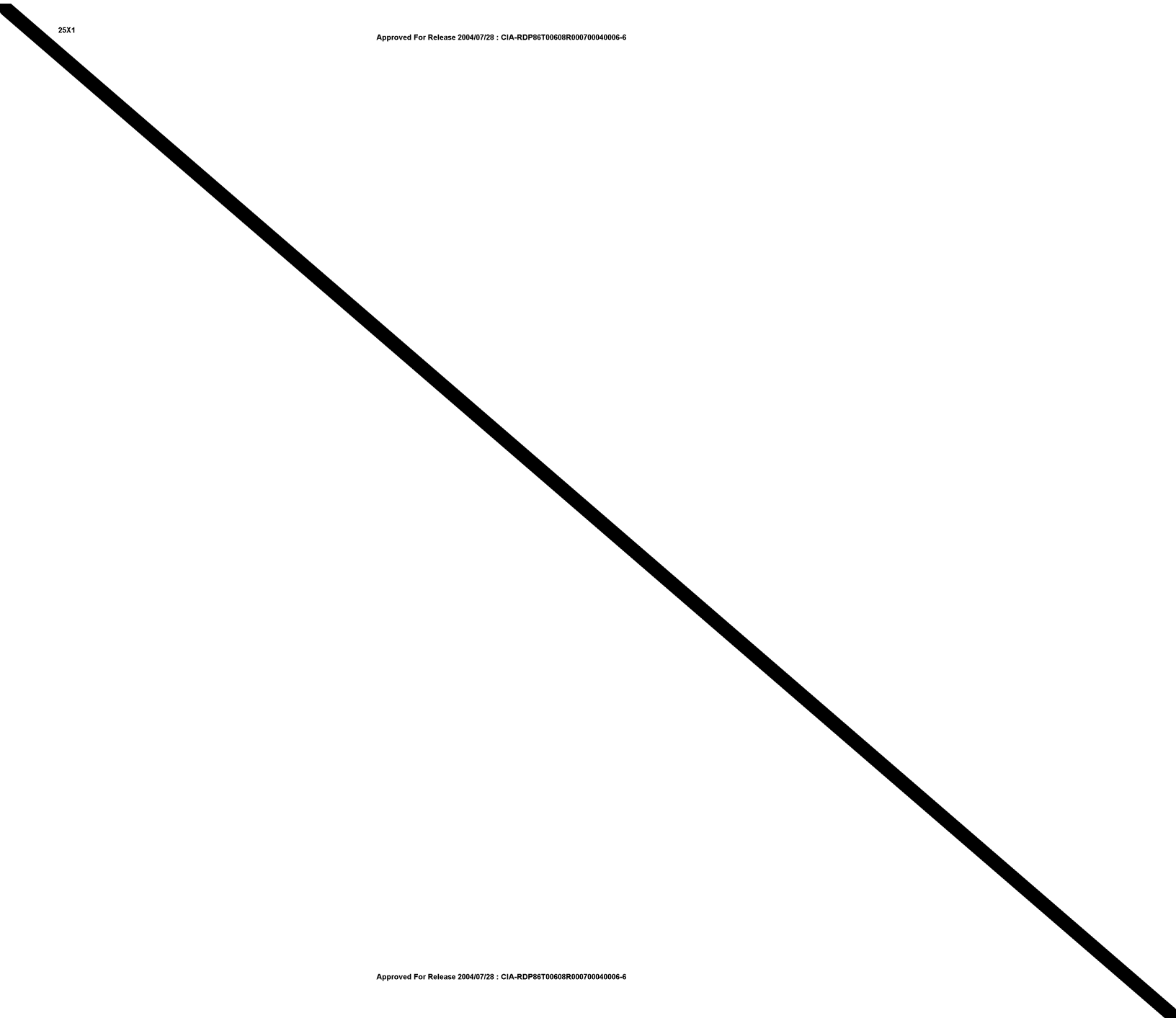

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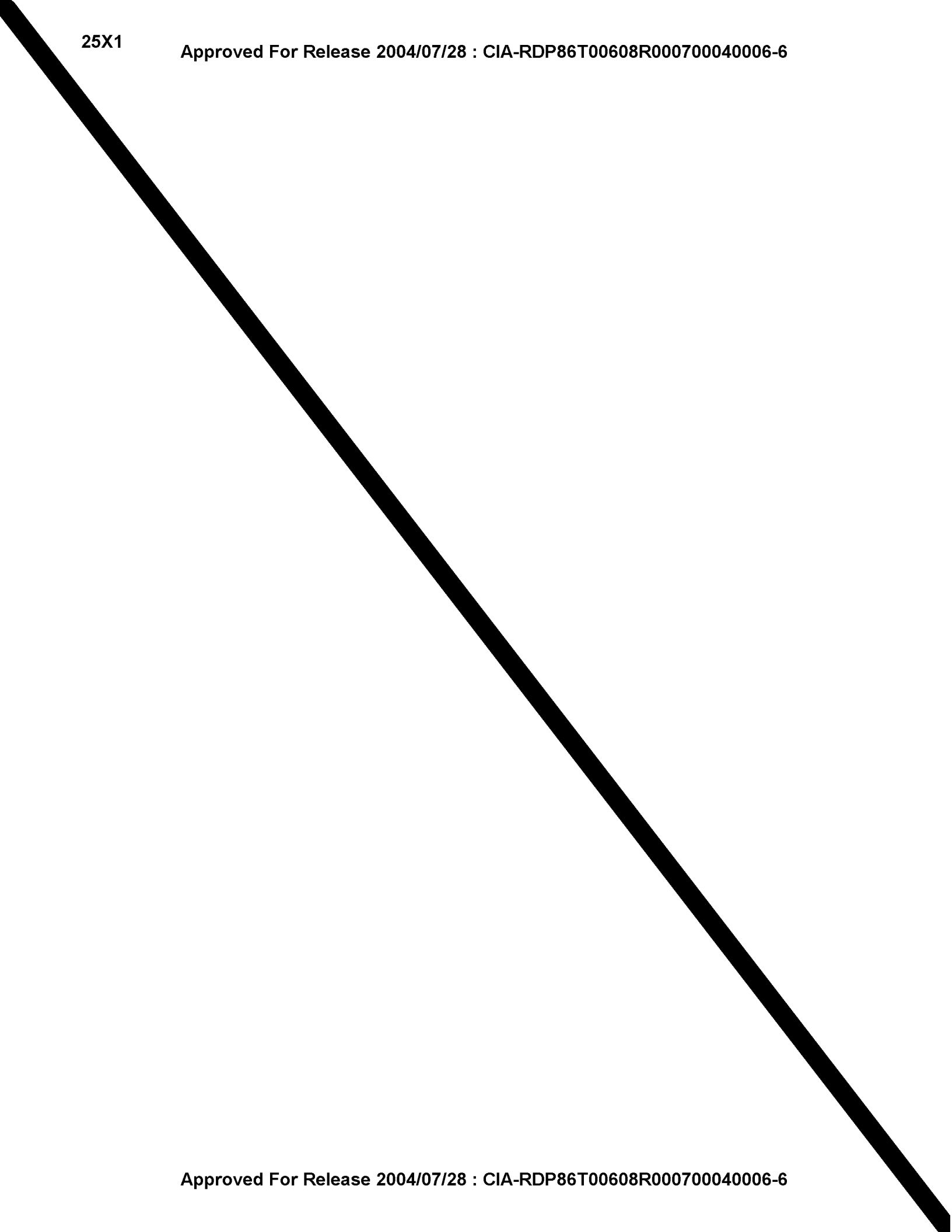

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WEEKLY SURVEYOR

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USSR AND EASTERN EUROPE

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Soviet psychologists have investigated changes in physiological and psychological indices under conditions of severe fatigue. Vehicle drivers, tracking console operators, and pilots participated in the tests which concluded that individuals were able to maintain high levels of performance over longer periods of time.

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[redacted]

The trend in Bulgaria toward incorporating ergonomic (human factors) principles in all sectors of the economy can only enhance the growth and development of Bulgarian industry. It can be expected that Bulgaria will follow the trend witnessed in the US and USSR and expand beyond the physiological orientation by including more research on psychological processes.

[redacted]

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Soviet psychiatrists at the Serbskiy Central Scientific Research Institute of Forensic Psychiatry have conducted a study which concluded that argumentative paranoiac states occur following psychotraumatic circumstances affecting the interests of the subjects, and they bear the imprint of infringement of the individual's rights. Thus, if an individual becomes indignant and argumentative following his arrest for action against the State, he runs the risk of being diagnosed: paranoiac state, argumentative type, an example of the ways psychiatry can be used by the State for the suppression of dissidents.

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[redacted]

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European USSR experienced up to 5 to 12 degrees centigrade above-normal temperatures during much of January. Such abnormally high temperatures probably have resulted in a premature loss of winter grain seedling resistance to cold. Excessive and unseasonal growth of the plants contributes to the probability of damage from spring frosts.

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Soviet interest in developing technology for the production of high-analysis phosphate fertilizer ties in with recent Soviet agreements signed with US and Italian firms for the construction of ammonia plants in the USSR. The Soviet technology most likely involves treating raw phosphate rock with acid, the oldest and still the most important commercial process for making quality phosphate fertilizers.

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Analysis presented in a recent Soviet technical paper is further evidence of recent and continuing Soviet research and development on the turbulent wake generated by submerged submarines with the probable objective of developing means for submarine wake detection and tracking.

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CHINA

The recent 4th National People's Congress, PRC, has appointed a new Minister of Education, Chou Jung-hsin. Now that the Ministry of Education has been reconstituted and the State Science and Technology Commission has been reported active, it is believed that the PRC has returned to its former mode of organization for science and education.

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LATIN AMERICA

South American procedures in ophthalmology are innovative and would be potential areas for cooperative efforts as it is likely that they would be of mutual benefit for all concerned. Such innovation was surprising because ordinarily South America relies on North America for its technology science base.

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The April date represents a slight delay in earlier plans to launch the satellite near the end of 1974. Nevertheless, the Indians have done a commendable job in developing the payload in a relatively short period of time.

[redacted]

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MIDDLE EAST AND ISLAMIC WORLD

India plans to launch it first satellite in April from the USSR with a Soviet launch vehicle.

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Soviet-Indian Scientific Satellite Scheduled for April Launching: India plans to launch its first satellite in April from the Soviet Union with a Soviet launch vehicle. The satellite will carry instruments to conduct experiments in fields such as X-ray astronomy and solar neutrons and gamma rays. Data will be transmitted to receiving sites in India and the USSR. [redacted] 25X1

Comment: The launch of the Indian satellite by the Soviets in April represents a slight delay in earlier plans to launch near the end of 1974. Although occasional friction has developed during the course of the program between Indian

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and Soviet scientists, overall it has proceeded relatively smoothly. The most common Indian complaint has been related to Soviet reluctance to provide information about the launch and the launch vehicle which is reminiscent of some of the complaints that French scientists had in the earlier days of their cooperative efforts. It appears, however, that the Soviets are becoming significantly more sophisticated in their international cooperative space efforts.

The Indians have done a commendable job in developing the payload for this satellite in the relatively short period of time that has elapsed since May 1972 when the agreement was signed. The satellite weighs about 300 kg and plans are to launch it from Kapustin Yar into a 600 km orbit with a launch inclination of about 51 degrees.

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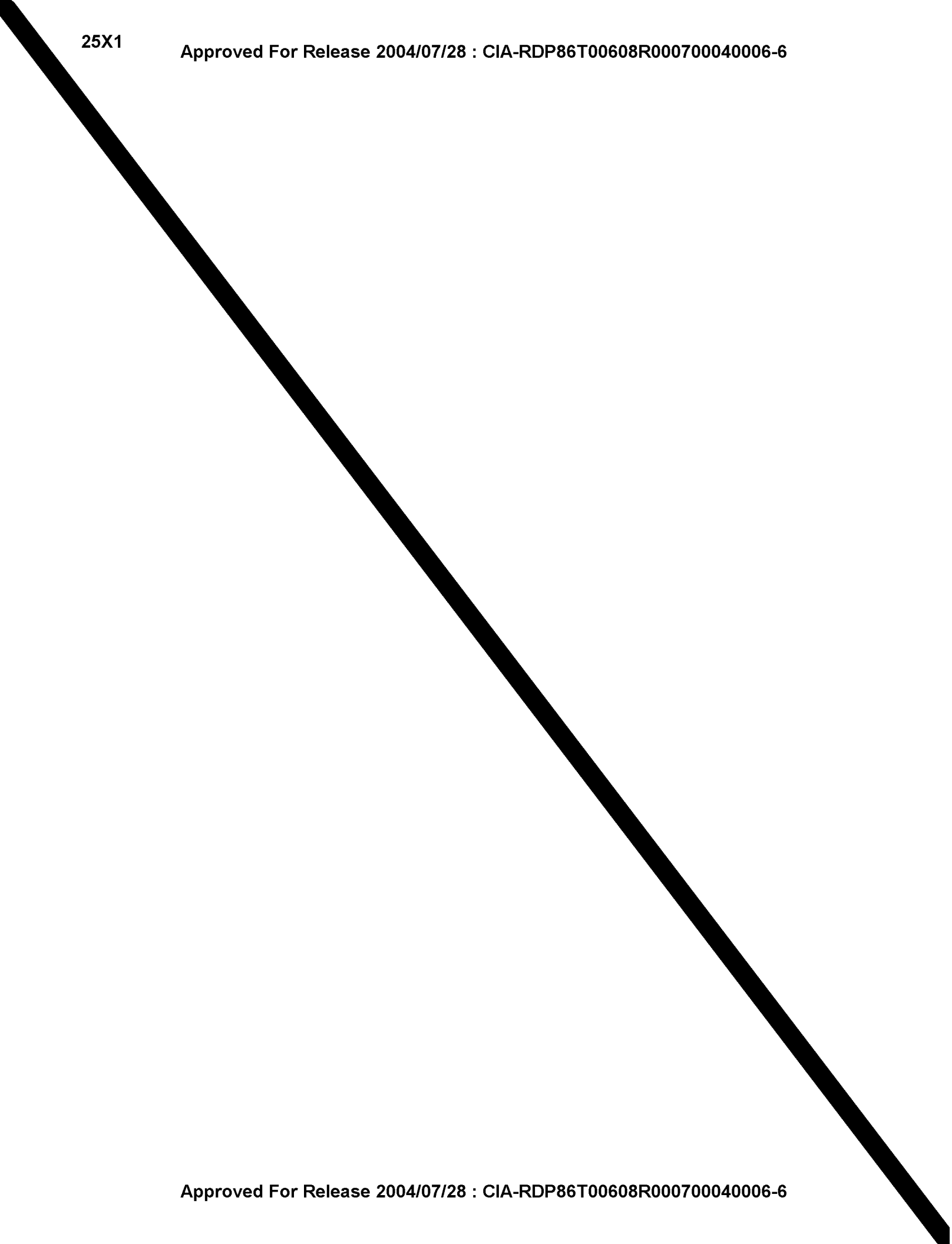

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South American Procedures in Ophthalmology Are Innovative; A US authority in visual perception [redacted] 25X1

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[redacted] states that scientific achievements in Colombia, while obviously not advanced in some areas, are remarkably innovative in ophthalmology. The Barraquer ophthalmology clinic in Bogota, considered to be one of the finest centers for ophthalmic surgery in the world, is noted for a number of innovations in general ophthalmic surgery and eye care. Surgical procedures have been developed to correct refractive error. These operations are not performed routinely anywhere else in the world. This operation involves excising a portion of the cornea and reshaping it by means of a cutting tool before replacing it in the patient's eye. This operation is particularly important in the tropics because of difficulties involved in maintaining the sanitary conditions necessary in the successful use of contact lenses. The operating theaters are completely enclosed in plastic "bubbles" so that an observer literally stands over the surgeon's shoulder and is permitted a close view of the entire operation. In addition, the dissecting microscope is connected to a closed-circuit television system which monitors the surgical field for observers outside the bubble and for the patient's family in the waiting room. This desire of the surgical teams to interact with their patients, families, and observers is believed to reduce the anxiety level and instill a justifiable level of confidence in the skill of the surgeons. [redacted]

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Comment: These innovative procedures developed in Colombia for correction of visual deficiencies are surprising, since South America ordinarily relies on North America for its technological science base. These procedures would be potential areas for cooperative efforts as it is likely that they

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would be of mutual benefit for all concerned.

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AGROTECHNOLOGY AND FOOD RESOURCES

Abnormally Warm Weather Threatens Soviet Winter Grains: European USSR experienced 5 to 12 degrees centigrade above-normal temperatures during much of January, further increasing the area of winter grains left devoid of protective snow cover. In southern European USSR, the fall-sown winter grains have resumed growth. Of the fields with excessive growth for this time of year, some have reached the stem-extension phase, a stage of growth normally not reached until spring. Soil moisture supplies in the one-meter depth are good in most of the Moldavia-Ukraine-North Caucasus area. Since no strong freezes had occurred in any of the areas where snow cover was either light or entirely lacking, the Soviets describe the condition of grains as satisfactory. They note, however, that high soil temperatures bereath the light snow cover over the Central Black Soil Zone are unfavorable for the winter grains in that area.

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Comment: While the weather may continue to favor the winter grains (largely wheat), the abnormally high temperatures have caused the plants to be extremely vulnerable to damage in the event of a sudden shift to the normal extreme cold temperatures during the next 1 to 2 months. The above normal temperatures probably have resulted in a premature lowering of seedling resistance to cold. Normally the grains also would be protected by snow cover which is lacking over most of the USSR winter grains belt. Excessive and unseasonal growth as a result of the warm weather contributes to the probability of damage from spring frosts.

Areas with extensive winter damage can be reseeded to lower yielding, feed-type spring grains--at a loss of wheat output and additional expenditure of seed, fuels, and other inputs. Uncertainties as to the likelihood of a shift to normal cold conditions preclude making a firm projection of actual wheat losses. It should be noted, however, that heavy winter kill contributed to the sharp downturn in USSR grain production in 1972 which led to large purchases of US wheat.

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Soviets Develop Technology for the Production of High-Analysis Phosphate Fertilizer: Soviet specialists of the State Scientific Research and Planning Institute of Nitrogen Industry and Organic Synthesis Products, Tashkent, reportedly have worked out a technology for the production of ammonium polyphosphate containing 80 percent nutrients. The Soviets state that this

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concentrated phosphate fertilizer is characterized by slow action which permits a full application to the soil in the spring, thus avoiding the need for supplementary feeding later in the growing season. In addition, tests have shown that it increases crop yields 10 percent more than conventional fertilizers.

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Comment: The fact that Soviet interest in better phosphate fertilizers is showing up at this time, after years of neglect, ties in with recent Soviet agreements signed with US and Italian firms for the construction of a number of ammonia plants in the USSR. The production of these plants plus a barter agreement that provides for the importation of 1 million tons of US phosphoric acid per year for 20 years should furnish ample raw materials for the manufacture of ammonium polyphosphate. But until the first of the ammonia plants comes on stream, probably in 1978, and the phosphoric acid begins arriving from the US, it is not likely that this high analysis phosphate fertilizer will be produced in quantities significant to Soviet agriculture.

The technology "worked out" by the Soviets most likely involves treating raw phosphate rock with acid, the oldest and still the most important commercial process for making quality phosphate fertilizers. The manufacture of these phosphates involves, as an intermediate step, the production of phosphoric acid which is combined with ammonia to produce the ammonium phosphates. The 80 percent nutritive content claimed for the "poly" phosphate probably breaks down to about 17 percent nitrogen and 63 percent phosphorus pentoxide (P_2O_5).

The manufacture of concentrated phosphate fertilizers requires expensive equipment, and the Soviets have preferred, in the past, to use ordinary superphosphate and finely ground raw rock phosphate "for reasons of expediency." It was almost certain, however, that eventually they would turn to phosphates of better quality and higher concentration. At least half of the arable land in the Soviet Union is deficient in phosphorus, and the high-analysis phosphate fertilizers with their greater solubility can be expected to increase crop yields, raise protein content, and speed the ripening of grain. Additional advantages of the high analysis over the low analysis fertilizers are found in the cost of bagging, handling, and transportation per unit of plant nutrient.

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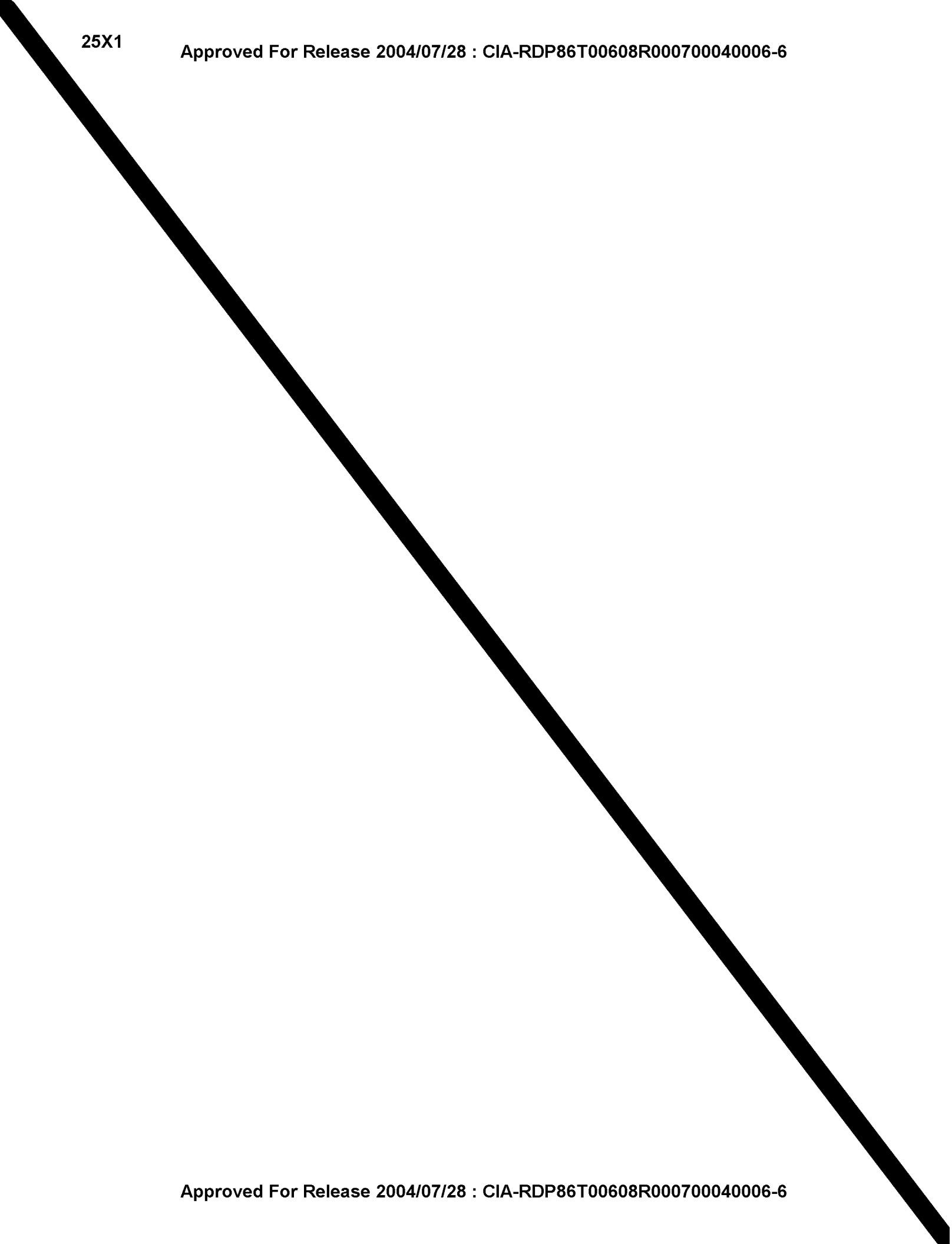

Soviets Study Prolonged Fatigue: Soviet psychologists, Lt. Col. V. L. Marishchuk and R. V. Kuznetsov, recently published an investigation of changes in physiological and psychological indices under conditions of severe fatigue. Vehicle drivers, tracking console operators, and pilots participated in different portions of an experiment designed to establish performance data on skilled tasks executed over extended time periods. Physiological measures obtained from the subjects during task performance indicated that the experimental conditions produced severe fatigue. Responses to a word association test (a form of projective testing) indicated that the subjects experienced a general depressive mood as a result of the long periods of performance. Nonetheless, the main conclusion of the study was that individuals were able to maintain high levels of performance over long periods of time.

Comment: The results of this study could be applied to Soviet assessments of operator reliability in a number of complex military systems. The data could be used by Soviet human engineers to improve the design of operator stations in terms of work space layout, equipment arrangement, control panel and selective information displays. This would reduce or eliminate fatigue producing operations from weapon systems requiring extended operator duty cycles. Such a procedure would be particularly useful in designing air defense radar stations where operator vigilance is an important aspect of system effectiveness.

The reported use of projective tests in this study is somewhat unique. Such tests usually are strongly criticized by Soviet psychologists. Most Soviet military psychologists appear to lack the sophistication required to conduct a successful projective testing program. The procedure reportedly used with the projective test indicated to the subjects the responses which the testers thought to be correct and thus probably contaminated and invalidated the results.

Soviet Psychiatric Study of Paranoia Has Political Implications: In a study of 68 subjects who had received the diagnosis of psychopathy with signs of paranoiac development at the Serbskiy Central Scientific Research Institute of Forensic Psychiatry, the authors categorized 70 percent as belonging to the argumentative (litigious, querulant) subtype. Of the 48 patients

demonstrating the "argumentation" syndrome, 16 had been arrested for hooliganism and 10 for infraction of passport laws. Tending to dwell for a long time on negative experiences, the "argumentative" patients demonstrated the frequent formation of ideas concerned with the "struggle for truth" and justice. The study concluded that "argumentative paranoiac states occur following psychotraumatic circumstances affecting the interests of the subjects, and they bear the imprint of infringement of the individuals rights."

Comment: The Serbskiy Institute has played a prominent role in the psychiatric evaluation and incarceration of dissidents. That a preoccupation with the "struggle for truth" and justice can be considered diagnostic of paranoia clearly can be used by the State as a way of suppressing outspoken dissidents. One of the most interesting aspects of this article is the candor reflected in the conclusion that such argumentative paranoiac states bear the imprint of infringement of the individuals rights and follow traumatic circumstances affecting the interests of the subjects. Thus, if an individual becomes indignant and argumentative following his arrest for actions against the State, he runs the risk of being diagnosed: paranoiac state, argumentative type. There is also a "useful" diagnostic category for those patients who do not argue: schizophrenic reaction, characterized by apathy and withdrawal.

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Bulgaria's Human Factors (Ergonomic) Program Shows Strong Growth: The Communist Party in Bulgaria officially endorsed the development of human factors (ergonomy) as a science in 1971. Subsequently, a bureau has been established to perform ergonomic reviews of all new or imported equipment. The number of ergonomic laboratories is proliferating within industrial enterprises, government ministries, medical establishments and technical institutes. At the apex of the ergonomic councils is the National Council of Ergonomy and Industrial Aesthetics, headed by Professor N. Boshev. Under the auspices of the National Council, there are approximately 30 Regional and 400 Plant Councils of Ergonomy and Industrial Aesthetics. At present, physiologists comprise about 60 percent of the specialists and consequently, solutions to man-machine problems are generally explored in terms of the physiological correlates of work behavior.

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Comment: The trend towards incorporating ergonomic principles in all sectors of the economy can only enhance the growth and development of Bulgarian industry. The

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preponderance of physiologists in ergonomy is indicative of the fact that the Bulgarian program is in a developmental stage. Early research in both the US and USSR also displayed an initially strong emphasis on physiological correlates of the work environment as they relate to improving the design of technical systems. In the US, approximately 57 percent of the ergonomic specialists are psychologists. Such a high percentage of psychologists cannot be expected in Bulgaria for sometime for two main reasons: (1) the advent of psychologists in ergonomics usually coincides with an economy which has gone beyond the initial phase of rapid technological advancement, and (2) the Department of Psychology was just established at Sofia University in 1974.

If the exuberance with which the educational and industrial community embraced ergonomy can serve as a benchmark, it can be expected that Bulgaria will follow the trend witnessed in the US and USSR and expand beyond the physiological orientation by including more research on psychological processes such as perception, memory and attention, along with a more careful consideration of small group dynamics in the work environment. Catalysts to this change most likely will be the speed with which the Bulgarian economy becomes technologically complex and the success of the ergonomic programs currently in progress.

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SCIENTIFIC AND TECHNICAL RESOURCES

Major Changes Indicated in PRC Science and Education Administration: According to the China Domestic News Service, the recent 4th National People's Congress has appointed a new Minister of Education, Chou Jung-hsin. Other new ministers were appointed to some of the industrial ministries, including Liu Hsi-yao as Minister of the 2nd Ministry of Machine Industry.

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Comment: The Science and Education Group (SEG), ostensibly China's chief science and education policy body, appears to have been abolished. The SEG was set up during the Cultural Revolution replacing the Ministry of Education and the State Science and Technology Commission. Now that the Ministry of Education has been reconstituted and the State Science and Technology Commission has been reported active again, it is believed that the PRC has returned to its former mode of organization for science and education. Representatives of the SEG had intimated last fall that the SEG was to be changed. Its former Director was Liu Hsi-yao, now Minister of the 2nd Ministry. The PRC's chief science officer has not yet been identified.

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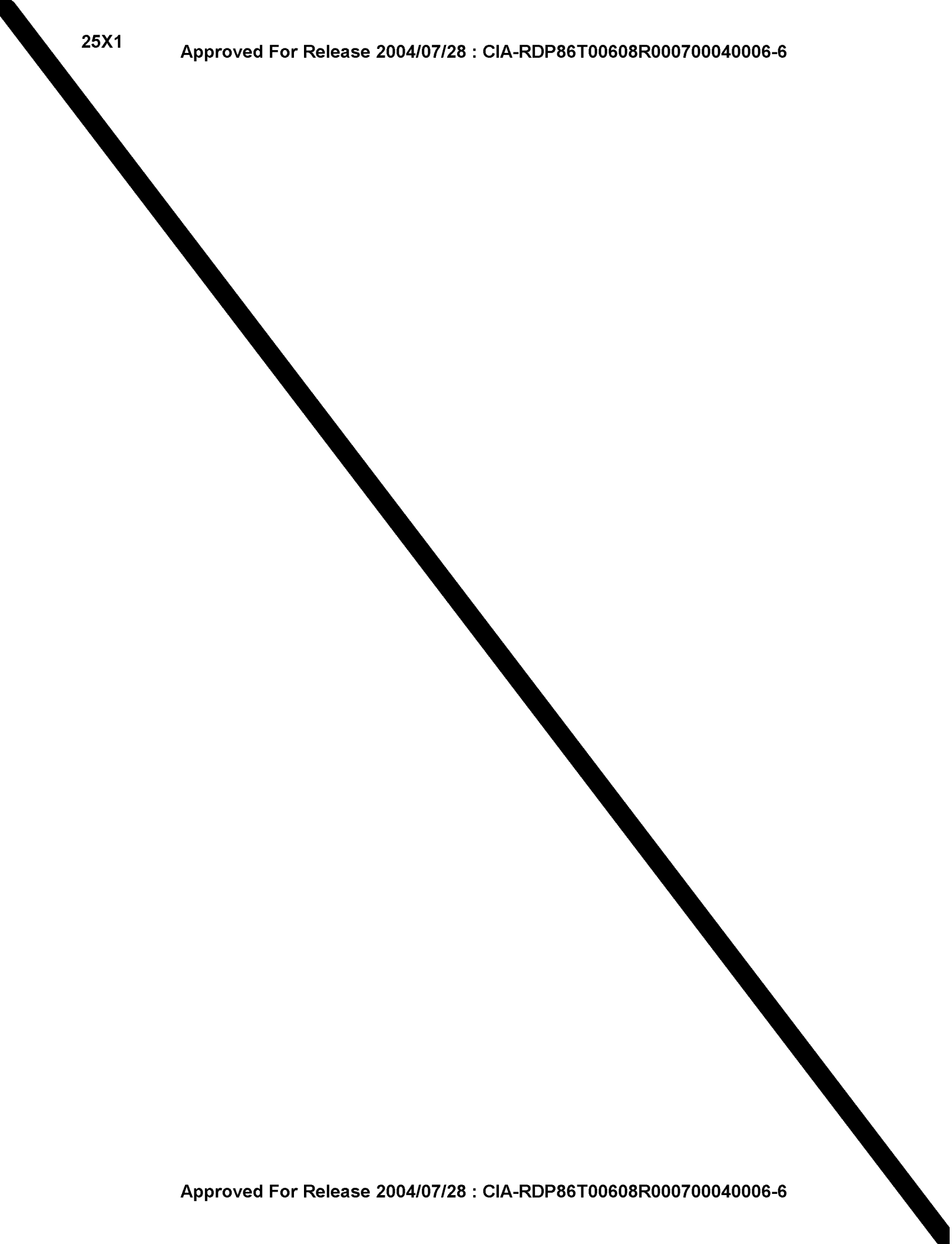

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Recent Soviet R&D Related to Submarine Wake Detection Is Identified: A recent Soviet technical paper by Yu. D. Cheshechkin, who is cited as being at the Institute of Physio-Technical and Radiotechnical Measurements, Leningrad, addresses the characteristics of submerged jets and wakes in a slightly stratified fluid. The initial growth, collapse and spreading of the jets and wakes and the resultant generation of internal waves are identified. In addition, certain problems in modelling the phenomena in a laboratory are briefly mentioned.

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Comment: The anlaysis presented in this paper is further evidence of recent and continuing Soviet research and development on the turbulent wake generated by submerged submarines with the probable objective of developing means for submarine wake detection and trailing.